Statement of Basis

Minor Air Quality Permit

Royal C. Johnson Veterans Memorial Hospital
Sioux Falls, South Dakota

South Dakota Department of Environment and Natural Resources

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1.0 Background

The Royal C. Johnson Veterans Memorial Hospital (formerly known as Sioux Falls VA Medical Center) located in Sioux Falls, South Dakota, provides comprehensive health care to eligible veterans in eastern South Dakota, northwestern Iowa, and southwestern Minnesota. The primary standard industrial classification (SIC) code for the facility is 8062 – General Medical and Surgical Hospitals. These are facilities primarily engaged in providing general medical and surgical services and other hospital services.

Royal C. Johnson's minor air quality permit was renewed on November 19, 2007. The permit expires on November 19, 2012. The permit was issued with enforceable permit conditions to limit emissions below the major source thresholds under the Title V air quality operating permit program. On February 24, 2012, Royal C. Johnson submitted an application for a Title V air quality permit. Rather than renew the minor air quality permit, the facility requested a Title V air permit to allow more flexibility for the facility to manage energy use of the boilers and generators to maximize energy savings and for emergency operations. The facility submitted additional information on March 29, 2012. On September 5, 2012, Brian Gnewuch, GEMS Coordinator for Royal C. Johnson, notified the department that the facility no longer wanted to pursue a Title V air quality operating permit and requested that the minor air quality permit for the facility be renewed with all generators permitted for emergency use.

The following units and processes are covered under Royal C. Johnson's existing minor air quality operating permit:

Unit	Description	Maximum Operating Rate	Control Device
#1	Boiler #1 - A 1980 Johnstone Boiler Company boiler, model #200. The boiler is fired by natural gas and fueled with distillate oil.	400 horsepower	Not Applicable
#2	Boiler #2 - A 1980 Johnstone Boiler Company boiler, model #200. The boiler is fired by natural gas and fueled with distillate oil.	400 horsepower	Not Applicable
#3	Boiler #3 - A 1980 Johnstone Boiler Company boiler, model #200. The boiler is fired by natural gas and fueled with distillate oil.	400 horsepower	Not Applicable
#4	Emergency Generator #1 - 1986 Caterpillar generator, model #SR4. The generator is fueled with distillate oil.	650 kilowatts	Not Applicable

Unit	Description	Maximum Operating Rate	Control Device
#5	Emergency Generator #10 - 2008 Caterpillar generator, model C18 DITA. The generator is fueled with distillate oil.	900 horsepower	Not Applicable
#6	Emergency Generator #11 - 2008 Caterpillar generator, model C18 DITA. The generator is fueled with distillate oil.	900 horsepower	Not Applicable
#7	Emergency Generator #12 - 2008 Caterpillar generator, model C18 DITA. The generator is fueled with distillate oil.	900 horsepower	Not Applicable

Based on the information provided in the permit application, the following equipment and processes will be reviewed for coverage under the permit:

- Unit #1 –Boiler #1 – 1980 Johnson Boiler Company steam boiler, model S4579, with a maximum designed operating rate of 20.95 million Btus per hour heat input. The boiler is fueled with natural gas and distillate oil.
- Unit #2 – Boiler #2 – 1980 Johnson Boiler Company steam boiler, model S4581, with a maximum designed operating rate of 20.95 million Btus per hour heat input. The boiler is fueled with natural gas and distillate oil.
- Unit #3 – Boiler #3 – 1980 Johnson Boiler Company steam boiler, model S4580, with a maximum designed operating rate of 20.95 million Btus per hour heat input. The boiler is fueled with natural gas and distillate oil.
- Unit #4 –1986 Caterpillar emergency generator, model SR4 3508 (serial # 6MA0070), with a maximum designed operating rate of 665 kilowatts. The generator is fueled with distillate oil.
- Unit #5 –2008 Caterpillar emergency generator, model LC7 (serial # G7A02567), with a maximum designed operating rate of 600 kilowatts. The generator is fueled with distillate oil.
- Unit #6 –2008 Caterpillar emergency generator, model LC7 (serial # G7A02566), with a maximum designed operating rate of 600 kilowatts. The generator is fueled with distillate oil.
- Unit #7 –2010 Caterpillar emergency generator, model LCY (serial # G7A03359), with a maximum designed operating rate of 600 kilowatts. The generator is fueled with distillate oil.
- 1981 Caterpillar emergency generator, model SR4, (serial # 449BH3072), with a maximum designed operating rate of 260 kilowatts. The generator is fueled with natural gas and distillate oil.
- 1993 Onan emergency generator, model 40DGAE (serial # 1920484283), with a maximum designed operating rate of 40 kilowatts. The generator is fueled with distillate oil.

- 2004 Caterpillar emergency generator, model SR4HV 3516, with a maximum designed operating rate of 2000 kilowatts. The generator is fueled with distillate oil.

2.0 New Source Performance Standards

The department reviewed the new source performance standards (NSPS) standards in 40 CFR Part 60 and determined that the following may be applicable.

2.1 40 CFR Part 60 Subpart Dc

Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

The provisions of this subpart are applicable to each steam generating unit that commenced construction, modification, or reconstruction after June 9, 1989, and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million Btu per hour) or less, but greater than or equal to 2.9 MW (10 million Btu per hour).

Boilers #1, #2, and #3 each have a maximum designed heat input capacity of 20.95 million Btu per hour. However, the boilers were constructed prior to June 9, 1989. Therefore, the boilers are not subject to the provisions of this subpart.

2.2 40 CFR Part 60 Subpart IIII

Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

Subpart IIII is applicable to owners and operators of stationary compression ignition (CI) internal combustion engines (ICE) that:

- Commence construction after July 11, 2005 where the stationary CI ICE are manufactured after April 1, 2006 and are not fire pump engines; or
- Modify or reconstruct their stationary CI ICE after July 11, 2005.

Units #5, #6, and #7 are stationary compression ignition engines that were manufactured after April 1, 2006, and are not fire pump engines. Therefore, Units #5, #6, and #7 are subject to this subpart. The other four generators were manufactured prior to April 1, 2006, and are not subject to the provisions of this subpart.

Units #5, #6, and #7 have a displacement of 18.13 liters and 6 cylinders for a displacement of 3.0 liters per cylinder. All three emergency generators have a maximum engine power less than 3,000 horsepower but greater than 50 horsepower and are certified to meet the Tier 2 emission limits in this subpart.

3.0 New Source Review

ARSD 74:36:10:01 states that New Source Review (NSR) regulations apply to areas of the state which are designated as nonattainment pursuant to the Clean Air Act for any pollutant regulated under the Clean Air Act. Royal C. Johnson Veterans Memorial Hospital is located in Sioux Falls, South Dakota, which is in attainment or unclassifiable for all the pollutants regulated under the Clean Air Act. Therefore, Royal C. Johnson Veterans Memorial Hospital is not subject to NSR review.

4.0 Prevention of Significant Deterioration

A PSD review applies to new major stationary sources and major modifications to existing major stationary sources in areas designated as attainment under Section 107 of the Clean Air Act for any regulated pollutant. The following is a list of regulated pollutants under the PSD program:

1. Total suspended particulate matter (TSP);
2. Particulate matter 10 microns in diameter or less (PM10);
3. Particulate matter 2.5 microns in diameter or less (PM2.5);
4. Sulfur dioxide (SO_2);
5. Nitrogen oxides (NOx);
6. Carbon monoxide (CO);
7. Ozone – measured as volatile organic compounds (VOCs);
8. Lead;
9. Greenhouse gases (carbon dioxide, nitrous oxide, methane, etc.)
10. Fluorides;
11. Sulfuric acid mist;
12. Hydrogen sulfide;
13. Reduced sulfur compounds; and
14. Total reduced sulfur.

If the source is considered one of the 28 named PSD source categories listed in Section 169 of the federal Clean Air Act, the major source threshold is 100 tons per year of any regulated pollutant, except for greenhouse gases. The major source threshold for all other sources is 250 tons per year of any regulated pollutant, except for greenhouse gases.

Royal C. Johnson Veterans Memorial Hospital is not classified as one of the 28 named PSD categories. Therefore, the major source threshold for criteria air pollutants under the PSD program for the Royal C. Johnson Veterans Memorial Hospital is 250 tons per year.

The major source threshold for greenhouse gases is given below:

1. New PSD source because of a criteria air pollutant, the major source threshold for greenhouse gases is 75,000 tons per year of carbon dioxide equivalent or more;
2. New PSD source if greenhouse gas emissions are 100,000 tons per year of carbon

dioxide equivalent or more;

3. For an existing PSD source because of a criteria air pollutant, a major modification for greenhouse gases is an increase of 75,000 tons per year of carbon dioxide equivalent or more;
4. For an existing non-PSD source that has the potential to emit 100,000 tons per year of carbon dioxide equivalent emissions or more, a major modification for greenhouse gases is an increase of 75,000 tons per year of carbon dioxide equivalent or more; and
5. In addition to subsection (2) and (4), a specific greenhouse gas, without calculating the carbon dioxide equivalent, also needs to emit greater than 100 or 250 tons per year, whichever is applicable, to be regulated.

4.1 Emission Factors and Potential Emissions

The department uses stack test results to determine air emissions whenever stack test data is available from the source or a similar source. When stack test results are not available, the department relies on manufacturing data, material balance, EPA's Air Pollutant Emission Factors AP-42 document, or other methods to determine potential air emissions.

Potential emissions for each applicable pollutant are calculated by assuming the unit operates every day of the year at the maximum design capacity.

Units #1, #2 and #3 – Natural Gas

An industrial boiler is defined in EPA's Compilation of Air Pollutant Emission Factors, also known as AP-42, as having a heat input value less than 100 million Btus per hour. Boilers #1, #2, and #3 each have a heat input capacity of 20.95 million Btu per hour. Therefore, the boilers are classified as industrial boilers

The emission factors for boilers burning natural gas are derived from AP-42, Table 1.4.-1 through Table 1.4-4 (7/98). The following emission factors are for boilers with heat input capacities less than 100 million Btu per hour:

- Total Suspended Particulate (TSP) = 7.6 pounds/MMcf;
- Particulate ≤ 10 microns in diameter (PM10) [1] = 7.6 pounds/MMcf;
- Particulate ≤ 2.5 microns in diameter (PM2.5) = 7.6 pounds/MMcf;
- Nitrogen Oxides (NO_X) = 32 pounds/MMcf;
- Sulfur Dioxide (SO_2) = 0.6 pounds/MMcf;
- Volatile Organic Compounds (VOC) = 5.5 pounds/MMcf;
- Carbon Monoxide (CO) = 84 pounds/MMcf;
- Carbon Dioxide (CO2) = 120,000 pounds/MMcf;
- Nitrous oxide (N2O) = 2.2 pounds/MMcf;
- Methane = 2.3 pounds/MMcf; and
- Total Hazardous Air Pollutants (HAPs) = 1.889 pounds/MMcf.

[1] – All of the particulate emitted by a boiler fueled with natural gas is assumed to be less than 0.1 microns in diameter. Therefore, the emission factor for PM10 is equivalent to TSP and PM2.5.

The heating value of natural gas is assumed to be 1,050 Btus per million cubic feet (MMcf). The potential natural gas usage for the boilers is calculated using Equation 4-1 and the maximum designed heat input. For greenhouse gases, the result of Equation 4-1 needs to be multiplied by 1, 310, and 21 for carbon dioxide, nitrous oxide, and methane, respectively, to convert the results to carbon dioxide equivalent.

Equation 4-1 – Annual natural gas usage

$$Maximum\ Heat\ Input \frac{MMBtus}{hour} \times \frac{8{,}760 hours}{year} \times \frac{10^6 Btus}{1 MMBtu} \times \frac{cf}{1{,}050 Btus} \times \frac{MMcf}{10^6 cf}$$

The maximum calculated annual natural gas usage for each boiler is 174.8 million cubic feet per year. Calculations for determining the potential emissions from the boilers while burning natural gas may be viewed in Appendix A.

Units #1, #2, and #3 – Distillate Oil

The emission factors for boilers burning distillate oil are derived from AP-42, Tables 1.3-1, 1.3-2, 1.3-3, 1.3-6, 1.3-8, 1.3-9, 1.3-10, and 1.3-12 (5/10). The sulfur content of the distillate oil is assumed to be 0.05 percent by weight. The following emission factors are for boilers with heat input capacities less than 100 million Btu per hour.

- TSP = 3.3 pounds per 10^3 gallon;
- PM10 = 2.3 pounds per 10^3 gallon;
- PM2.5 = 1.55 pounds per 10^3 gallon;
- SO_2 = 142 x S pounds per 10^3 gallon; where S is weight % sulfur
  = 142 x 0.05 pounds per 10^3 gallon
  = 7.1 pounds per 10^3 gallon;
- NO_X = 20 pounds per 10^3 gallon;
- CO = 5 pounds per 10^3 gallon;
- VOC = 0.2 pounds per 10^3 gallon;
- Carbon Dioxide (CO2) = 22,300 pounds/10^3 gallon;
- Nitrous oxide (N2O) = 0.26 pounds/10^3 gallon;
- Methane = 0.052 pounds/10^3 gallon; and
- HAPs = 4.10 x 10^{-2} pounds per 10^3 gallon.

The heating value of distillate oil is assumed to be 140,000 Btus per gallon. The potential distillate oil usage for Boilers #1, #2, and #3 is calculated using Equation 4-2 and the maximum design operating rate. For greenhouse gases, the result of Equation 4-2 needs to be multiplied by 1, 310, and 21 for carbon dioxide, nitrous oxide, and methane, respectively, to convert the results to carbon dioxide equivalent.

Equation 4-2 – Annual distillate oil usage

$$Maximum\ Heat\ Input \frac{MMBtus}{hour} \times \frac{8{,}760 hours}{year} \times \frac{10^6\ Btus}{1 MMBtu} \times \frac{gallon}{140{,}000 Btus}$$

The maximum calculated annual distillate oil usage for each boiler is 1,310,871 gallons per year. Calculations for determining the potential emissions from the boilers while burning distillate oil may be viewed in Appendix A.

Table 4-1 provides a summary of the potential emissions based on the fuel (natural gas or distillate oil) for each boiler.

Table 4-1 – Potential Emissions by Fuel Type (tons/year)

Unit	Fuel Type	TSP	PM10	PM2.5	SO_2	NO_x	CO	$CO2_{eq}$ [1]	VOC	HAPs
#1 (Boiler #1)	Natural Gas	0.7	0.7	0.7	0.1	2.8	7.3	10,552	0.5	0.2
	Distillate Oil	2.2	1.5	1.0	4.7	13.1	3.3	14,670	0.1	0.0
#2 (Boiler #2)	Natural Gas	0.7	0.7	0.7	0.1	2.8	7.3	10,552	0.5	0.2
	Distillate Oil	2.2	1.5	1.0	4.7	13.1	3.3	14,670	0.1	0.0
#3 (Boiler #3)	Natural Gas	0.7	0.7	0.7	0.1	2.8	7.3	10,552	0.5	0.2
	Distillate Oil	2.2	1.5	1.0	4.7	13.1	3.3	14,670	0.1	0.2

[1] - $CO2_{eq}$ means carbon dioxide equivalent.

The highest calculated potential emissions for each pollutant, regardless of fuel type, are considered for the purpose of this review. Table 4-2 summarizes the results of the potential emission calculations for each of the permitted units as taken from Table 4-1 and shows the total maximum potential to emit for each pollutant for the boilers.

Table 4-2 – Maximum Potential Emissions (tons/year)

Unit	TSP	PM10	PM2.5	SO_2	NO_x	CO	$CO2_{eq}$ [1]	VOCs	HAPs
#1 (Boiler #1)	2.2	1.5	1.0	4.7	13.1	7.3	14,670	0.5	0.2
#2 (Boiler #2)	2.2	1.5	1.0	4.7	13.1	7.3	14,670	0.5	0.2
#3 (Boiler #3)	2.2	1.5	1.0	4.7	13.1	7.3	14,670	0.5	0.2

[1] - $CO2_{eq}$ means carbon dioxide equivalent.

Generators (> 600 horsepower)

Uncontrolled emission factors for each applicable pollutant are derived from the Compilation of Air Pollutant Emission Factors, Fifth Edition, Volume 1 (AP-42) and from the manufacturer's specifications submitted as part of the application. Stationary internal combustion engines are classified by AP-42 – Fifth Edition according to their horsepower rating. A large stationary internal combustion engine is one that has a horsepower rating greater than 600 horsepower. Units #4, #5, #6, #7, and the 2004 Caterpillar generator are large stationary internal combustion engines because they each have a rating greater than 600 horsepower. The air pollutant emission factors for large stationary internal combustion engines burning distillate oil are derived from AP-42 – Fifth Edition, Tables 3.4-1, 3.4-2, 3.4-3, and 3.4-4, October 1996 and may be viewed below:

- TSP = 0.0697 pounds per MMBtus;
- PM10 = 0.0573 pounds per MMBtus;
- PM2.5 = 0.0556 pounds per MMBtus;
- SO_2 = 1.01 x S pounds per MMBtus; where S is weight % sulfur
  = 1.01 x 0.05 pounds per MMBtus
  = 0.0505 pounds per MMBtus;
- NO_X = 3.2 pounds per MMBtus;
- CO = 0.85 pounds per MMBtus;
- VOC = 0.09 pounds per MMBtus;
- Carbon Dioxide (CO2) = 165 pounds per MMBtus;
- Methane = 0.01 pounds per MMBtus; and
- HAPs = 4.10×10^{-2} pounds per MMBtus.

The sulfur content for Unit #5, #6, and #7 was assumed to be 0.05 % sulfur by weight for potential emission calculations even though the sulfur content limit for these units is 0.0015 % sulfur by weight. There was no emission factor available for nitrous oxide. Therefore, the department assumed nitrous oxide emissions are negligible.

Potential emissions for emergency generators are calculated based on 500 hours of operation per year rather than 8,760 hours per year. In a memorandum from John Seitz to EPA regional offices dated September 5, 1995, the potential to emit from an emergency generator may be based on operating only 500 hours per 12 month period. Therefore, 500 hours per year will be used as the annual operations for the emergency generators. Royal C. Johnson does not have control equipment associated with the generators; therefore, the potential uncontrolled and controlled emissions are the same.

Equation 4-3 was used to calculate the potential emissions based on the emission factors provided above for each pollutant and the maximum heat output capacity of the generator in kilowatts.

Equation 4-3 – Potential Emission Calculations for Generators (> 600 horsepower)

$$\text{Potential Emissions}\left[\frac{tons}{year}\right] = \left(\frac{\text{Emission Factor}\left[\frac{pounds}{MMBtu}\right] \times 500\left[\frac{hours}{year}\right] \times \text{Heat Output}[kW] \times 3414.4\left[\frac{Btu}{hr-kW}\right]}{2000\left[\frac{pounds}{tons}\right] \times 10^{6}\left[\frac{Btu}{MMBtu}\right]}\right)$$

Table 4.3 summarizes the potential emissions from the large diesel generators.

Table 4-3 – Potential Emissions from Generators (> 600 horsepower)

Unit	TSP (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)	SO_2 (ton/yr)	NO_x (ton/yr)	CO (ton/yr)	$CO2_{eq}$ [1] (ton/yr)	VOCs (ton/yr)	HAPs (ton/yr)
#4	0.04	0.03	0.03	0.03	1.82	0.48	94	0.05	0.00
#5	0.04	0.03	0.03	0.03	1.64	0.44	85	0.05	0.00
#6	0.04	0.03	0.03	0.03	1.64	0.44	85	0.05	0.00
#7	0.04	0.03	0.03	0.03	1.64	0.44	85	0.05	0.00
2004 Caterpillar generator	0.12	0.10	0.10	0.09	5.46	1.45	282	0.15	0.00

[1] - $CO2_{eq}$ means carbon dioxide equivalent.

Generators (< 600 horsepower)

Emission factors for generators with a rating less than 600 horsepower are derived from AP-42 – Fifth Edition, Tables 3.3-1 and 3.3-2, October 1996 and may be viewed in Table 4-4. The 1981 Caterpillar emergency generator has a maximum heat input capacity of 260 kilowatts and is fueled with natural gas and distillate oil. The 1993 Onan emergency generator has a maximum heat input capacity of 40 kilowatts and is fueled with distillate oil.

Table 4-4 –Uncontrolled Emission Factors for Generators (< 600 horsepower)

Pollutant	TSP/PM10/PM2.5	SO_2	NO_x	CO	CO_2	VOCs	HAPs
Emission Factor, lbs/MMBtus	0.31	0.29	4.41	0.95	164	0.35	$3.8x10^{-3}$

There was no emission factor available for nitrous oxide or methane. Therefore, the department assumed nitrous oxide and methane emissions are negligible and carbon dioxide emissions are considered carbon dioxide equivalent emissions.

Equation 4-3 was used to calculate the potential emissions based on the emission factors given in Table 4-4 for each pollutant and the maximum heat output capacity in kilowatts.

Table 4-5 summarizes the potential emissions from the small emergency generators.

Table 4-5 – Potential Emissions from Generators (< 600 horsepower)

Unit	TSP/PM10 (ton/yr)	SO_2 (ton/yr)	NO_x (ton/yr)	CO (ton/yr)	CO_2 (ton/yr)	VOCs (ton/yr)	HAPs (ton/yr)
1981 Caterpillar generator	0.07	0.06	0.98	0.21	36.4	0.08	0.00
1993 Onan generator	0.01	0.01	0.15	0.03	5.6	0.01	0.00

4.2 Potential Emissions Summary

The potential emissions from the units reviewed for coverage under the minor air quality operating permit are summarized in Table 4-6.

Table 4-6 – Potential Emissions Summary

Unit	TSP	PM10	PM2.5	SO_2	NO_x	CO	$CO2_{eq}$ [1]	VOCs	HAPs
#1	2.2	1.5	1.0	4.7	13.1	7.3	14,670	0.5	0.2
#2	2.2	1.5	1.0	4.7	13.1	7.3	14,670	0.5	0.2
#3	2.2	1.5	1.0	4.7	13.1	7.3	14,670	0.5	0.2
#4	0.04	0.03	0.03	0.0	1.8	0.5	94	0.1	0.0
#5	0.04	0.03	0.03	0.0	1.6	0.4	85	0.1	0.0
#6	0.04	0.03	0.03	0.0	1.6	0.4	85	0.1	0.0
#7	0.04	0.03	0.03	0.0	1.6	0.4	85	0.1	0.0
1981 Caterpillar generator	0.07	0.07	0.07	0.06	0.98	0.21	36.4	0.08	0.0
1993 Onan generator	0.01	0.01	0.01	0.01	0.15	0.03	5.6	0.01	0.0
2004 Caterpillar generator	0.12	0.10	0.10	0.1	5.5	1.5	282	0.2	0.0
Totals	**7.0**	**4.8**	**3.3**	**14.3**	**52.5**	**25.3**	**44,683**	**2.2**	**0.6**

[1] - $CO2_{eq}$ means carbon dioxide equivalent.

Royal C. Johnson's potential emissions of any criteria pollutant are less than 250 tons per year. In addition, Royal C. Johnson does not have the potential to emit greater than 100,000 tons of carbon dioxide equivalent greenhouse gases. Therefore, Royal C. Johnson is considered a minor source under the PSD program and is not subject to PSD requirements.

5.0 National Emission Standards for Hazardous Air Pollutants

The department reviewed the National Emission Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR Part 61and determined that there are no finalized or promulgated NESHAP standards applicable to Royal C. Johnson's operations.

6.0 Maximum Achievable Control Technology Standards

The department reviewed the maximum achievable control technology (MACT) standards in 40 CFR Part 63 and determined that the following may be applicable.

6.1 40 CFR Part 63, Subpart ZZZZ

National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

The provisions of this subpart are applicable to owners or operators of a stationary reciprocating internal combustion engine (RICE) at a major or area source of HAP emissions. A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy

into mechanical work and which is not mobile. A major source of HAP emissions is a plant site that emits or has the potential to emit any single HAP at a rate of 10 tons or more per year or any combination of HAP at a rate of 25 tons or more per year. An area source of HAP emissions is a source that is not a major source of HAPs. Royal C. Johnson is not a major source of HAPs. In accordance with 40 CFR § 63.6590(a)(1)(iii), a stationary RICE located at an area source of HAPs is existing if construction or reconstruction of the stationary RICE commenced before June 12, 2006. In accordance with 40 CFR § 63.6590(a)(2)(iii), a stationary RICE at an area source of HAPs is new if construction commenced on or after June 12, 2006.

Unit #4, the 1993 Onan emergency generator, the 1981 Caterpillar emergency generator, and the 2,000 kilowatt Caterpillar generator (Unit #8) were constructed before June 12, 2006, and are existing institutional emergency stationary RICE located at an area source of HAP emissions. Therefore, in accordance with 40 CFR § 63.6590(b)(3)(viii), these emergency generators are not subject to the requirements of this subpart and subpart A under this part, including initial notification requirements.

Units #5, #6, and #7 are considered new stationary RICE because they were constructed on or after June 12, 2006. Therefore, in accordance with 40 CFR § 63.6590(c)(1), a new stationary RICE located at an area source must meet the requirements of this subpart by meeting the applicable requirements of 40 CFR Part 60 Subpart IIII for compression ignition engines. No further requirements apply to Units #5, #6, and #7 under this subpart.

7.0 Other Requirements

7.1 State Emission Limits

Total suspended particulate and sulfur dioxide emission limits are applicable to fuel burning units. In accordance with ARSD 74:36:06:02(1)(b), a fuel burning unit with a heat input equal to or greater than 10 million Btus per hour heat input may not exceed the particulate emissions rate determined by 7-1:

Equation 7-1 – Particulate Emission Limit for Fuel Burning Units

$$E = 0.811 \times H^{-0.131}$$

where:

- E = emission rate in pounds per million Btu heat input, and
- H = heat input in million Btus per hour.

Units #1, #2, and #3 each have a maximum designed heat input capacity of 20.95 million Btus per hour. The particulate emission limit calculated using Equation 7-1 is 0.5 pounds per million Btu.

In accordance with ARSD 74:36:06:02(1)(a), a fuel burning unit with heat input values less than 10 million Btus per hour may not exceed 0.6 pounds of particulate matter per million Btus of heat input. Unit #4 and Unit #8 are institutions emergency generators that are exempt from NSPS and/or MACT standards for generators. The maximum heat input capacity of the Unit #4 is 2.27 million Btus per hours and the maximum heat input capacity of Unit #8 is 6.83 million Btus per hour. Therefore, the particulate emission limit for Unit #4 and Unit #8 is 0.6 pound per million Btu.

In accordance with ARSD 74:36:06:02(2), a fuel burning unit may not emit sulfur dioxide emissions to the ambient air in an amount greater than three pounds of sulfur dioxide per million Btus of heat input based on a three-hour rolling average, which is the arithmetic average of three contiguous one-hour periods.

Visible emission limits are applicable to units that discharge into the ambient air. In accordance with ARSD 74:36:12, a facility may not discharge into the ambient air more than 20 percent opacity for all units.

Units #5, #6, and #7 are subject to NSPS or MACT standards that contain particulate matter and sulfur dioxide limits. In accordance with ARSD 74:36:06:01, a unit that is subject to a NSPS that contains limits on particulate matter and/or sulfur dioxide is not applicable to the state's particulate matter and/or sulfur dioxide emission limits.

The potential emissions from the 1993 Onan emergency generator and 1981 Caterpillar emergency generator each are less than two tons per year per criteria air pollutant. Therefore, in accordance with ARSD 74:36:04:03(7), these units are not required to be permitted.

7.2 Performance Tests

Units #1, #2, #3, #4, and #8 are not subject to performance testing. Units #5, #6, and #7 are certified to Tier II standards for compression ignition stationary RICE. Therefore, no additional testing is required under the NSPS.

7.3 Summary of Applicable Requirements

Any source operating in South Dakota that meets the requirements of the Administrative Rules of South Dakota (ARSD) 74:36:04 is required to obtain a minor air quality permit. A minor source is defined as having the potential to emit greater than 25 tons per year but less than 100 tons per year of a criteria pollutant or less than 10 tons per year of a single hazardous air pollutant, or 25 tons per year of a combination of hazardous air pollutants.

Royal C. Johnson's potential emissions of any criteria pollutant are less than 100 tons per year and the facility is not a major source of HAPs. The facility is not required to obtain a Title V air quality operating permit for the emergency generators because the generators are located at an area source of HAPs. Therefore, the Royal C. Johnson Veterans Memorial Hospital will be required to operate within the requirements stipulated in the following regulations:

- ARSD 74:36:04 – Operating Permits for Minor Sources;
- ARSD 74:36:06 – Regulated Air Pollutant Emissions;
- ARSD 74:36:07 – New Source Performance Standards;
- ARSD 74:36:08 - National Emission Standards for Hazardous Air Pollutants; and
- ARSD 74:36:12 - Control of Visible Emissions.

8.0 Recommendation

Based on the information submitted in the permit application, DENR recommends conditional approval of a minor air quality permit for Royal C. Johnson Veterans Memorial Hospital in Sioux Falls, South Dakota. Questions regarding this permit review should be directed to Marlys Heidt, Engineer III.